The Index of the Quality of the Air (IQUA)

What is the IQUA?

The IQUA is a system developed to provide the public with a meaningful measure of outdoor air quality. From the IQUA, we can effectively rate air quality ***Good***, ***Fair***, ***Poor*** or ***Very Poor***.

The IQUA converts concentrations of five major air pollutants to a single numerical value and matching description. For example, a rating of 0-25 indicates ***Good*** air quality, 26-50 is ***Fair***, 51-100 is ***Poor***, and more than 100 is ***Very Poor***.

The IQUA is based on outdoor concentrations of carbon monoxide, dust and smoke, nitrogen dioxide, ozone and sulphur dioxide. These pollutants are monitored continuously in Edmonton (central, northwest and east locations), Calgary (central, northwest and east locations), Red Deer and Fort Saskatchewan. Alberta Environment also operates an air monitoring station near Beaverlodge (35 km west-northwest of Grande Prairie). At the Edmonton, Calgary, Red Deer and Fort Saskatchewan stations an index value is calculated for each air pollutant. The concentration of each pollutant is converted hourly to an IQUA number, and the highest number each hour becomes the IQUA for that station.

How was the IQUA Developed?

A federal-provincial committee originally developed the IQUA in 1978. In 1995 the dust and smoke component of the index was modified to better represent the effects of small particles on air quality.

Good, ***Fair***, ***Poor*** and ***Very Poor*** air quality categories are related directly to guidelines under Alberta's Environmental Protection and Enhancement Act (EPEA). These guidelines reflect the maximum desirable, acceptable and tolerable levels specified by the National Air Quality Objectives.

For current air quality conditions call **427-7273** in Edmonton and **250-2099** in Calgary, or toll free by dialling **310-0000**.

IQUA rating	Frequency in Alberta	Description
Good	almost all the time	Desirable range: no known harmful effects to soil, water, vegetation, animals, materials, visibility or human health. The long-term goal is for air quality to be in this range all of the time in Canada.
Fair	occasional (typical when weather conditions inhibit pollutant dispersion)	Acceptable range: adequate protection against harmful effects to soil, water, vegetation, animals, materials, visibility and human health.
Poor	very seldom	Tolerable range: not all aspects of human health or the environment are adequately protected from possible adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
Very Poor	extremely rare	Intolerable range: in this range, continued high readings could pose a risk to public health.

Source: Environment Canada. 1980. Guideline for a short-term air quality index. A report by the Federal-Provincial committee on Air Pollution

Alberta
ENVIRONMENT

+8

An IQUA rating of 25 for a specific air pollutant corresponds to the federal maximum *desirable* level; a rating of 50 corresponds to the federal maximum *acceptable* level; and a rating of 100 corresponds to the federal maximum *tolerable* level.

How is the IQUA made available?

The IQUA is calculated and issued hourly for Edmonton and Calgary by Alberta Environment. It can be accessed by phoning **427-7273** in Edmonton and **250-2099** in Calgary or toll free by dialling **310-0000**. Current air quality conditions can also be accessed at Alberta Environment's web site (www.gov.ab.ca/env) - click on "Air" then "Air Quality Monitoring" then "Current Air Quality".

Alberta Environment provides this information through an automated air quality index reporting system, in which monitoring stations are automatically polled every hour. Data is then loaded into a database for internet and telephone access.

What causes high IQUA values in Edmonton and Calgary?

In both cities, air quality is rated ***Good*** at least 90 per cent of the time for any given year. The index will occasionally reach the ***Fair*** range (less than 10 per cent of the time). Air quality in both cities seldom reaches the ***Poor*** level (usually less than one per cent of the time), and the frequency of ***Very Poor*** index levels is very low (only twice from 1990 to 1999).

Fair, ***Poor*** or ***Very Poor*** air quality conditions usually occur when there is a strong temperature inversion and light winds. This combination of weather conditions will often create a layer of cool, stagnant air near the ground. Air pollutants, mostly from automobiles, are trapped in this layer of stagnant air. In Edmonton these conditions usually occur with the approach of a warm front. In Calgary, strong temperature inversions are common before a chinook arrives.

Fair and ***Poor*** air quality can also result from summer heat. In hot, sunny weather photochemical smog can form through complex chemical reactions involving oxides of nitrogen and volatile hydrocarbons. Photochemical smog has a light brown colour and can reduce visibility and affect breathing. Ground-level ozone is a photochemical smog component that is a major concern.

References: Guidelines for the Index of the Quality of the Air; Report EPS 1/AP/3; Environment Canada; September, 1993.